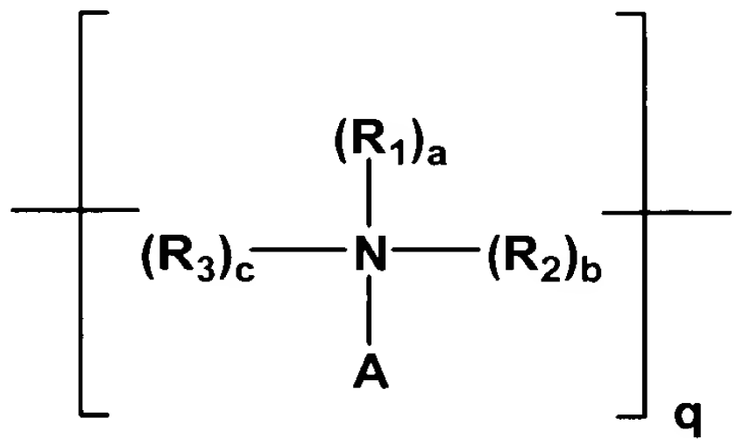
Amendments to the Claims

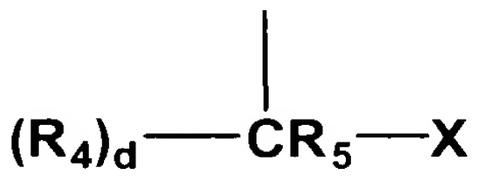
This listing of claims will replace all prior versions, and listings of claims in the application.

Claims 1-54 (Cancelled).

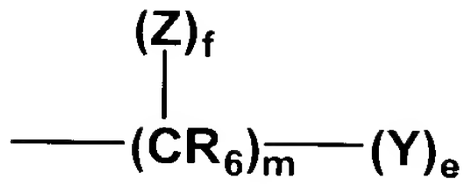
Claim 55 (Previously presented). A composition for use in synthesizing a nucleic acid molecule, comprising one or more enzymes having nucleic acid polymerase activity and one or more compounds having a chemical formula selected from the group consisting of formula I or formula II, or a salt thereof, wherein said compound is not betaine:

Formula I:



where A is 

;

where X is  ;

where N is positively charged;

wherein q = 1 to 100,000, wherein when q = 2 to 100,000 each monomer of formula I may be the same as or different from the other monomers of formula I;

wherein Z may be the same as or different from Y;

wherein each Y and Z are independently selected from the group consisting of -OH, $-NH_2$, -SH, $-PO_3H$, $-CO_2H$, $-SO_3H$ and hydrogen;

wherein f is an integer from 0 to 2, m is an integer from 0 to 20 and e is an integer from 0 to 2;

wherein R_4, R_5, and R_6 may be the same or different and are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, aryl, amino, mercaptan,

thiol, halo, nitro, nitrilo, hydroxy, hydroxyalkyl, hydroxyaryl, phosphato, alkoxy, oxide, ether, ester (alkanoyloxy), carboxy, carbonyl, sulfonyl, sulfonic and amido groups, and d is an integer from 0 to 2;

wherein a, b, and c are independently an integer from 0 to 1, with the proviso that no more than two of a, b, and c are zero;

wherein R_1, R_2 and R_3 may be the same or different and are independently selected from the group consisting of:

a) =O and;

b) $(W)_g$

|

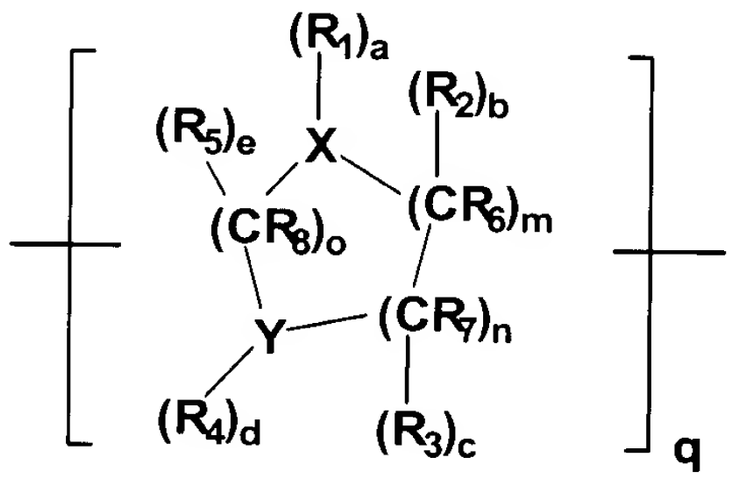
$-(CR_7)_n$;

with the proviso that no more than two of A, R_1, R_2 and R_3 are selected from the group consisting of hydrogen, methyl, ethyl and propyl; and

with the proviso that if one, and only one, of R_1, R_2 and R_3 is =O, then A is none of hydrogen, methyl, ethyl and propyl;

wherein each R_7 and W may be the same or different and are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, aryl, amino, thiol, mercaptan, halo, nitro, nitrilo, hydroxy, hydroxyalkyl, hydroxyaryl, phosphato, alkoxy, oxide, ether, ester (alkanoyloxy), carboxy, carbonyl, sulfonyl, sulfonic and amido groups; g is an integer from 0 to 2 and n is an integer from 0 to 20, with the proviso that if two of R_1, R_2, and R_3 are =O, then the other is not =O;

Formula II:



wherein Formula II is saturated or unsaturated;

wherein q = 1 to 100,000, wherein when q = 2 to 100,000, each monomer of formula II may be the same as or different from each other monomer of formula II;

wherein X is selected from the group consisting of N, C, O, P and S;

wherein Y is selected from the group consisting of O, N, S, P, C, -O-NH-, $-O-CH_2-NH-$, $-O-CH_2-O-$, $-NH-CH_2-NH-$, $-O-CH(CH_3)-NH-$, $-NH-CH(CH_3)-NH-$, $-O-CH(CH_3)-O-$, $-NH-C(CH_3)_2-NH-$, -O-S-, $-O-CH_2-S-$, -NH-S-, $-NH-CH_2-S-$, and

other mercaptan, phosphato, alkoxy, oxide, ether, esters (alkanoyloxy), carboxy, sulfonyl, sulfonic and amido groups;

with the proviso that if either X or Y is N, then the other is not C;

wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 may be the same or different and are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, aryl, amino, thiol, mercaptan, halo, nitro, nitrilo, hydroxy, hydroxyalkyl, hydroxyaryl, phosphato, alkoxy, oxide, ether, ester (alkanoyloxy), carboxy, sulfonyl, sulfonic and amido groups; and

wherein a, b, c, d, e, m, n and o are integers which may be the same or different and are independently selected from 0 to 2 for a, b, c, d, and e, and 0 to 5 for m, n and o.

Claim 56 (Previously presented). The composition of claim 55, with the proviso that when q=1 and one of $(R_1)_a$, $(R_2)_b$, and $(R_3)_c$ is oxygen and the other two are the same or different and are independently selected from the group consisting of hydrogen, methyl, ethyl and propyl, then A is not methyl, ethyl or propyl.

Claim 57 (Previously presented). The compositing of claim 55, wherein when a, b, or c is zero, the corresponding R group is a pair of electrons.

Claim 58 (Previously presented). The composition of claim 55, wherein Y and/or X are N and m, n and o are 1.

Claim 59 (Previously presented). The composition of claim 55, wherein Y and/or X are N and/or O, and m and n are 1, and o is 2.

Claim 60 (Previously presented). The composition of claim 55, wherein said composition comprises at least two compounds having the formula I or II, or salts or esters thereof.

Claim 61 (Previously presented). The composition of claim 60, wherein said composition comprises 2 to 5 compounds having the formula I or II, or salts or esters thereof.

Claim 62 (Previously presented). The composition of claim 60, wherein said composition comprises proline.

Claim 63 (Previously presented). The composition of claim 60, wherein said composition comprises an N-alkylimidazole compound.

Claim 64 (Previously presented). The composition of claim 63, wherein said N-alkylimidazole compound is 1-methylimidazole or 4-methylimidazole.

Claim 65 (Previously presented). The composition of claim 55, wherein said compound is selected from the group consisting of proline, glycine, 4-hydroxyproline, pipecolic acid, 4-methylmorpholine N-oxide, carnitine, ectoine, poly(2-ethyl-2-oxazoline) of average molecular weight about 50,000 to about 500,000 daltons, and poly(diallyldimethylammonium chloride) of average molecular weight about 100,000 to about 200,000 daltons.

Claim 66 (Previously presented). The composition of claim 60, wherein said compound is selected from the group consisting of proline, glycine, 4-hydroxyproline, pipecolic acid, 4-methylmorpholine N-oxide, carnitine, ectoine, poly(2-ethyl-2-oxazoline) of average molecular weight about 50,000 to about 500,000 daltons, and poly(diallyldimethylammonium chloride) of average molecular weight about 100,000 to about 200,000 daltons.

Claim 67 (Previously presented). The composition of claim 55, wherein said enzyme having nucleic acid polymerase activity is selected from the group consisting of a DNA polymerase, an RNA polymerase and a reverse transcriptase.

Claim 68 (Previously presented). The composition of claim 67, wherein said DNA polymerase is selected from the group consisting of *Taq*, *Tne*, *Tma*, *Pfu*, VENT™, DEEPVENT™ and *Tth* DNA polymerases, and mutants and variants thereof.

Claim 69 (Previously presented). The composition of claim 67, wherein said reverse transcriptase is selected from the group consisting of M-MLV reverse transcriptase, RSV reverse transcriptase, AMV reverse transcriptase, RAV reverse transcriptase, MAV reverse transcriptase and HIV reverse transcriptase, and mutants and variants thereof.

Claim 70 (Previously presented). The composition of claim 67, wherein said reverse transcriptase is substantially reduced in RNase H activity.

Claim 71 (Currently amended). A composition for use in synthesizing a nucleic acid molecule comprising one or more enzymes having nucleic acid polymerase activity and one or more isolated amino acids, wherein said amino acid is not methylglycine and is not dimethylglycine.

Claim 72 (Previously presented). A method for synthesizing a nucleic acid molecule, comprising:

(a) mixing a nucleic acid template with one or more of the compositions of claim 55 or claim 71 to form a mixture; and

(b) incubating said mixture under conditions whereby a first nucleic acid molecule complementary to all or a portion of said template is made.

Claim 73 (Previously presented). The method of claim 72, further comprising incubating said first nucleic acid molecule under conditions whereby a second nucleic acid molecule complementary to all or a portion of said first nucleic acid molecule is made.

Claim 74 (Previously presented). A nucleic acid molecule made according to the method of claim 72.

Claim 75 (Previously presented). A method for amplifying a nucleic acid molecule comprising:

(a) mixing nucleic acid template with one or more of the compositions of claim 55 or claim 71 to form a mixture; and

(b) incubating said mixture under conditions whereby a nucleic acid molecule complementary to all or a portion of said template is amplified.

Claim 76 (Previously presented). A method for sequencing a nucleic acid molecule comprising:

(a) mixing a nucleic acid molecule to be sequenced with one or more primers, one or more of the compositions of claim 55 or claim 71, one or more nucleotide and one or more terminating agents to form a mixture;

(b) incubating said mixture under conditions whereby a population of molecules complementary to all or a portion of said molecule to be sequenced is synthesized; and

(c) separating said population to determine the nucleotide sequence of all or a portion of said molecule to be sequenced.

Claim 77 (Previously presented). A kit for use in synthesis of a nucleic acid molecule, said kit comprising one or more of the compositions of claim 55 or claim 71.

Claim 78 (Previously presented). The kit of claim 77, wherein said kit comprises at least two of said compositions.

Claim 79 (Previously presented). The kit of claim 77, further comprising one or more components selected from the group consisting of one or more nucleotides, one or more DNA polymerases, one or more reverse transcriptases, one or more suitable buffers, one or more primers and one or more terminating agents.